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Max-Planck-Gesellschaft zur
Förderung der Wissenschaften eV
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CLAIMS

1. A method of producing single-stranded nucleic acid molecules from oligo- or polynucleotides wherein each of said oligo- or polynucleotides has a predefined 5' or 3' terminus, comprising the steps of

   (a) annealing an adaptor oligonucleotide simultaneously or step by step to

   (aa) a first oligo- or polynucleotide; and

   (ab) a second oligo- or polynucleotide

   wherein the 5'-terminus of said adaptor oligonucleotide is complementary in sequence to the 5' terminus of said first oligo- or polynucleotide and the 3'-terminus of said adaptor molecule is complementary in sequence to the 3' terminus of said second oligo- or polynucleotide; and optionally

   (a') simultaneously with or subsequently to step (a) annealing at least one further adaptor oligonucleotide to free termini of said first or second oligonucleotides and to free termini of further oligo- or polynucleotides;

   (b) optionally filling in gaps between the neighbouring ends of said oligo- or polynucleotides;

   (c) ligating said oligo- or polynucleotides; and

   (d) removing said at least one adaptor oligonucleotide,

   wherein said single-stranded nucleic acid molecules represent a collection of nucleic acid molecules and wherein either said first or said second oligo- or polynucleotide is invariable in sequence between all members of said collection of nucleic acid molecules.

2. The method of claim 1 wherein the complementarity in sequence is at least four nucleotides.

3. The method of claim 1 or 2 wherein annealing and ligation are simultaneously performed.

4. The method of any one of claims 1 to 3 wherein the adaptor oligonucleotide(s) in step (a) and/or (a') is/are provided in molar excess over the first or second or further oligo- or polynucleotides.

5. The method of any one of claims 1 to 4 wherein said first or said second oligo- or polynucleotide which is not invariable is variable in sequence between different members of said collection of nucleic acid molecules.

6. The method of any one of claims 1 to 5 wherein the further oligo- or polynucleotides are variable in sequence between different members of said collection of nucleic acid molecules.

7. The method of any one of claims 1 to 6 wherein the oligo- or polynucleotides representing said variable sequences are provided in molar excess over the nucleic acid molecule representing said invariable sequences.

8. The method of any one of claims 1 to 7 wherein the 5' or 3' termini of said oligo- or polynucleotides representing said variable sequences which anneal to said 5' or 3' termini of said adaptor oligonucleotide are invariable between different members of said oligo- or polynucleotides representing said variable sequences.

9. The method of any one of claims 1 to 8 where ligation is effected with T4/DNA ligase.

10. The method of any one of claims 1 to 9 wherein the ligation reaction is carried out in the presence of at least 5% polyethylene glycol.

11. The method of claim 7 wherein the ligation reaction is carried out in the presence of about 15% polyethylene glycol.

12. The method of claim 10 or 11 wherein said polyethylene glycol is polyethylene glycol 6000.

13. The method of any one of claims 1 to 10 wherein about 1 unit of T4 DNA ligase is reacted in step (c) with about 4 pmol of termini of the oligo- or polynucleotides annealed to said adaptor molecule(s).

14. The method of any one of claims 1 to 11 further comprising the step of purifying said single-stranded nucleic acid molecules.

15. The method of claim 14 wherein purification includes PAGE electrophoresis, HPLC or chromatography.

16. The method of any one of claims 1 to 15 further comprising modifying at least one of said oligo- or polynucleotides.

17. The method of any one of claims 1 to 15 wherein at least one of said oligo- or polynucleotides is modified.

18. The method of claim 16 or 17 wherein the modification is a ribonucleotide, a spacer or a nucleotide comprising a detectable label.

19. The method of any one of claims 16 to 18 wherein said oligo- or polynucleotides representing the invariable sequence are modified.

20. The method of any one of claims 1 to 19 further comprising employing members of said collection of nucleic acid molecules in the determination of SNPs in vitro.

21. The method of any one of claims 1 to 19 further comprising employing members of said collection of nucleic acid molecules in ligase-independent cloning or two-step PCR.